

REMARKS

The Examiner has rejected claim 7 under 35 U.S.C. Section 102(b) as being anticipated by U.S. Patent No. 3,710,623 to Boyd et al., and has rejected claims 8-24 as being obvious over the Boyd patent under 35 U.S.C. Section 103.

Applicant notes that the Boyd patent is directed to a magnetic pickup element adapted for flowmeters, and in particular discloses a device that uses a flux gate technique to count the rate or frequency of pulses due to passing turbine blades 11. See col. 2, line 66 – col. 3, line 24.

Notably, the Boyd patent does not disclose or suggest an eddy current sensor as claimed in the present invention. As discussed in the present application, by using the claimed configuration eddy currents are induced in the passing blades of, e.g., a turbine, and the resulting magnetic field disturbance can be sensed and analyzed for blade status information based on the electrical current in the sensing coil. Application, page 4, lines 2-5.

Example waveforms resulting from the sensing of eddy currents are illustrated in Figures 7-8 in the present application, and can be used to detect much more than simply the frequency of blade rotation, including blade stalls, blade tip clearance, bending, torsion, vibration, cracks and foreign object impacts. Application, page 1, lines 19-21. These advantageous measurements result from an eddy current sensor configuration which differs from the frequency-detecting flowmeter described by Boyd.

The high-strength static field created by the disclosed embodiments of the present invention can effectively penetrate the casing of an engine, which allows the sensor to be placed outside of the casing. Application, page 4, lines 5-8.

This emphasizes another distinction between the Boyd patent and the present invention. In Boyd, the electromagnetic pickup 18 is mounted in a chamber 16 which is formed within the flowmeter body 12. See Figure 1 and col. 2, lines 32-48, illustrating and describing how the chamber 16 is formed within the flowmeter body 12. In particular, the electromagnetic pickup element 18, which includes the permanent magnet 34 and the coil 20, extends partly through the casing or body 12.

This has the disadvantage of potentially compromising the strength of the casing. As discussed in the present application at page 2, lines 17-20, holes in the casing are undesirable because of degraded mechanical performance, and placing the sensor inside the casing is

additionally undesirable because of the expense of special modifications to accommodate the sensor.

The arrangement of Boyd is unnecessary for, and in fact teaches away from, the present invention. The claims as amended herein specify in each case that the magnet is mounted external to the casing or barrier; see amended independent claims 7, 13, 15, 20 and 21. Such a configuration allows the sensing of eddy currents due to the use of a high-strength stationery magnetic field, as described at page 3, line 21 – page 4, line 8, while avoiding the modifications to the casing and structural compromise inherent in Boyd.

Accordingly, applicant urges that the claims as amended are neither anticipated nor made obvious by the cited art, and thus that the amended claims are in condition for allowance, notice whereof is requested.

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The Commissioner is hereby authorized to charge any additional fees that may be due, including extension fees, or credit any overpayment to our Deposit Account No. 08-3038 (Order No. 02708.0180.NPUS01).

Respectfully submitted,

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